# Changes in Skill Performances Due to the Combination of SAQ and Skill-Based Training for the Basketball Players

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## ABSTRACT

This study aimed to investigate the impact of combining SAQ (Speed, Agility, and Quickness) training with skill-based drills on the performance of basketball skills. A total of 60 male college basketball players, aged between 18 and 25 years, from various colleges in Tamil Nadu, India, participated in the research. The participants were randomly assigned to four groups of 15 players each: one group received SAQ training, a second group engaged in sport-specific training, a third group underwent a combination of both SAQ and sport-specific training, and the fourth group served as a control. After a 12-week training period, all participants were evaluated on selected skill metrics, specifically dribbling and shooting accuracy. These assessments were conducted using standardized tests—the AAHPERD Control Dribble test and the AAHPERD Speed Spot Shooting test. The training programs for the experimental groups lasted for twelve weeks. Data collection involved measuring the skill performance variables both before and after the training intervention. The data were analyzed using ANCOVA, with a significance level set at 0.05. If the F-ratio for the adjusted means indicated a statistically significant difference, Scheffe's post hoc test was used to determine which groups differed specifically. Throughout the study, a significance threshold of 0.05 was maintained for hypothesis testing.

**Keywords:** Dribbling, Shooting, Skill Based Training, SAQ Training

## INTRODUCTION

Basketball training that centres on skill development aims to systematically cultivate both basic and advanced techniques crucial for effective gameplay. Instead of concentrating solely on overall physical fitness, this approach emphasizes sport-specific abilities such as dribbling, passing, shooting, footwork, defensive strategies, and decision-making skills. Given the fast-paced nature of basketball, which demands technical proficiency, tactical insight, and rapid execution, honing these skills is essential. Typically, skill-focused training involves a series of progressive drills designed to simulate real game scenarios, thereby improving motor skills, coordination, and key movement patterns. Modern training methods also stress practicing in realistic, game-like environments to boost players' perception, anticipation, spatial awareness, and overall basketball IQ. This type of training builds confidence, efficiency, and flexibility on the court. Integrating speed, agility, and quickness (SAQ) exercises with skill-focused training offers a holistic strategy for boosting basketball performance. SAQ training emphasizes enhancing players' capacity to perceive, process, and react swiftly to the ever-changing dynamics of the game, leading to improved decision-making and situational awareness (Gabbett, 2016). When this is combined with technical skill development—such as shooting, dribbling, and passing—it creates a balanced approach that enhances both technical ability and cognitive flexibility, which are essential for excelling in the fast-paced environment of basketball (Faigenbaum & Myer, 2010).

Research shows that combining SAQ (Speed, Agility, and Quickness) training with skill development exercises can significantly boost important performance factors such as reaction time, decision-making speed, and consistency in execution (Lloyd & Oliver, 2012). This integrated approach not only refines technical skills

but also enhances tactical understanding and the ability to adapt under pressure. For basketball athletes, employing a comprehensive training method like this can result in better in-game performance, increased strategic awareness, and a lower risk of injuries (Mulligan et al., 2016). The synergy created by integrating SAQ drills with skill-focused activities promotes overall skill improvement by simultaneously advancing physical capabilities, technical proficiency, and cognitive functions essential for competitive play.

## Methodology

This study aimed to investigate the impact of combining SAQ (Speed, Agility, and Quickness) training with skill-focused training on basketball performance. A total of 60 male college basketball players, aged between 18 and 25 years, from various colleges in Tamil Nadu, India, participated in the research. The participants were randomly assigned to four groups, each consisting of 15 players: one group received SAQ training, another engaged in sport-specific training, a third group underwent a combined regimen of both training approaches, and the fourth served as a control group. After the training period, all participants were evaluated on specific skill performance measures, including dribbling and shooting skills. These assessments were conducted using standardized tests, specifically the AAHPERD Dribbling Test and the AAHPERD Speed Spot Shooting Test.

## Training Procedure

The training programs for Groups I, II, and III lasted a total of 12 weeks. Each session, which included warm-up and cool-down phases, was scheduled in the mornings and had a duration of one hour. These sessions took place six days a week. The SAQ training group performed exercises such as stationary arm swings, agility ladder drills, tap exercises, quick hand tosses, step hurdle workouts, and lateral or side-step movements. The game-specific training group engaged in activities like basketball conditioning, dribbling drills, full-court practice, cone weaving, layup drills from the three-point arc, cone running exercises, sideline sprints, suicides, layup grabs, and defensive sliding drills. The combined training group participated in a blend of both SAQ and game-related drills.

## Statistical Procedure

After the training phase, all 60 participants were evaluated on selected skill performance variables, specifically dribbling and shooting. These skills were assessed using standardized tests such as the AAHPERD Control Dribble test and the AAHPERD Speed Spot Shooting test. The training interventions for Groups I, II, and III lasted a total of 12 weeks. Data collection occurred both before and after the 12-week training period, focusing on the specific skill variables. The data were analyzed using analysis of covariance (ANCOVA), with a significance level set at 0.05. When the F-ratio for the adjusted means indicated a significant difference, Scheffe's post hoc test was applied to determine which groups differed significantly. Throughout the analysis, a 0.05 level of significance was maintained for testing the study hypotheses.

## Analysis of the Data

The analysis of covariance on skill variables of the pre and post test scores of control group with game specific and SAQ training and combined training groups have been analyzed and presented in Table I and I.

**Table –I**
**Analysis of Covariance of Experimental Groups and Control Groups on Dribbling**

| | Control Group | SAQ Group | Skill based Group | Combined group | SoV | Sum of Squares | df | Mean squares | 'F' ratio |
|---|---|---|---|---|---|---|---|---|---|
| Pretest Mean | 10.29 | 10.31 | 10.33 | 10.28 | B | .021 | 3 | .007 | 1.53 |
| SD | 0.07 | 0.05 | 0.07 | 0.05 | W | .257 | 56 | .005 | |
| | 10.27 | 9.26 | 8.25 | 9.09 | B | 30.97 | 3 | 10.32 | |

| Posttest Mean SD | 0.05 | 0.12 | 0.23 | 0.15 | W | 1.41 | 56 | .025 | 409.60* |
|---|---|---|---|---|---|---|---|---|---|
| Adjusted Posttest Mean | 10.27ª | 9.26ª | 8.25ª | 9.09ª | B | 29.862 | 3 | 9.954 | 387.91* |
| | | | | | W | 1.411 | 55 | .026 | |

*Significant at 0.05 level of confidence. The table values required for significance at 0.05 level of confidence for 3 and 56 (df)=2.77, 3 and 55(df)=2.78 respectively.

The data presented in the table show the pretest average dribbling times for four groups: control, SAQ training, game-specific fitness training, and a combined training group, with values of 10.29, 10.31, 10.33, and 10.28 seconds respectively. The calculated F statistic of 1.53 was below the critical threshold of 2.77, indicating that there were no statistically significant differences in dribbling speed among the groups at the pretest stage. After completing the twelve-week training program, the posttest means for dribbling times were recorded as 10.27, 9.26, 8.25, and 9.09 seconds for the control, SAQ, game-specific, and combined training groups, respectively. The F value derived from this data was 409.60, which is well above the critical value of 2.77, suggesting significant differences among the groups following the training period. When adjusting for pretest scores, the posttest means remained at 10.27, 9.26, 8.25, and 9.09 for the respective groups. The F statistic for this adjusted data was 387.912, also exceeding the critical value, confirming the presence of statistically meaningful differences across the groups after accounting for initial scores. Given the significance of the F ratio, Scheffe's post hoc analysis was performed to explore specific group differences. The results, including pairwise comparisons between the control group and the training groups, as well as among the various training groups, along with their confidence intervals indicating significance, are summarized in Table II.

**Table II**
**Scheffe's Confidence Interval Test Scores and the Mean Differences between the Groups on Dribbling**

| Means of | | | | Paired Mean Difference | Confidence interval |
|---|---|---|---|---|---|
| Control Group | SAQ Group | Skill based Group | Combined group | | |
| 10.27 | 9.26 | | | 1.01 | |
| 10.27 | | 8.25 | | 2.02 | |
| 10.27 | | | 9.09 | 1.09 | |
| | 9.26 | 8.25 | | 1.01 | 0.16 |
| | 9.26 | | 9.09 | 0.17 | |
| | | 8.25 | 9.09 | 0.84 | |

*Significant at 0.05 level

The mean differences in performance between the control group and the various training groups were 1.01 for the SAQ group, 2.02 for the game-specific training group, and 1.09 for the combined training group. Each of these differences exceeded the confidence interval threshold of 0.16, suggesting that all training methods resulted in meaningful improvements relative to the control. Furthermore, the comparison between the SAQ and game-specific training groups yielded a difference of 1.01, while the difference between the SAQ and combined training groups was 0.17; both values surpassed the 0.15 cutoff, indicating significant distinctions. The difference between the game-specific and combined training groups was 0.84, which also exceeded the confidence interval, confirming a significant difference. Overall, the findings demonstrate that all three training approaches effectively enhanced speed, with the skill-based training group showing the most pronounced improvement compared to the others.

**Table –III**
**Analysis of Covariance of Experimental Groups and Control Groups on Shooting**

| | Control Group | SAQ Group | Skill based Group | Combined group | SoV | Sum of Squares | df | Mean squares | 'F' ratio |
|---|---|---|---|---|---|---|---|---|---|
| Pretest Mean | 25.20 | 26.26 | 26.33 | 26.06 | B | 12.33 | 3 | 4.11 | 2.35 |
| SD | 1.61 | 1.33 | 1.11 | 1.16 | W | 97.60 | 56 | 1.74 | |
| Posttest Mean | 25.46 | 26.66 | 30.26 | 33.06 | B | 540.00 | 3 | 180.00 | 108.46* |
| SD | 1.187 | 1.11 | 1.22 | 1.57 | W | 92.93 | 56 | 1.66 | |
| Adjusted Posttest Mean | 25.93[a] | 26.48[a] | 30.04[a] | 33.00[a] | B | 480.30 | 3 | 160.10 | 155.52* |
| | | | | | W | 56.62 | 55 | 1.02 | |

*Significant at 0.05 level of confidence. The table values required for significance at 0.05 level of confidence for 3 and 56 (df)=2.77, 3 and 55(df)=2.78 respectively.

The pretest data revealed that the average shooting scores were 25.20 for the control group, 26.26 for the group undergoing game-specific fitness training, 26.33 for the SAQ training group, and 26.06 for the combined training group. The computed F value of 2.35 was below the critical threshold of 2.77, indicating that there were no statistically significant differences in shooting performance among the groups at this initial stage. Following twelve weeks of training, the posttest scores increased to 25.46 for the control group, 26.66 for the SAQ group, 30.26 for the game-specific training group, and 33.06 for the combined training group. The F value for these scores was 108.46, which surpasses the critical value of 2.77, signifying that there were notable differences among the groups after the training period.

Adjusted posttest means were calculated as 25.93 for the control group, 26.48 for the SAQ group, 30.04 for the game-specific training group, and 33.0 for the combined training group. The F statistic of 155.52, also exceeding the critical value, supported the presence of significant differences across the groups after controlling for initial scores. Given the significance of the F ratio, Scheffe's post hoc analysis was performed to pinpoint specific group disparities. The pairwise comparisons, including mean differences and confidence intervals, are presented in Table IV to illustrate the significance of differences between the training groups and the control group.

**Table IV**
**Scheffe's Confidence Interval Test Scores and the Mean Differences between the Groups on Shooting**

| Means of Control Group | SAQ Group | Skill based Group | Combined group | Paired Mean Difference | Confidence interval |
|---|---|---|---|---|---|
| 25.93 | 26.48 | | | 0.55 | |
| 25.93 | | 30.04 | | 4.11 | |
| 25.93 | | | 33.00 | 7.07 | |
| | 26.48 | 30.04 | | 3.56 | 1.06 |
| | 26.48 | | 33.00 | 6.52 | |
| | | 30.04 | 33.00 | 2.96 | |

*Significant at 0.05 level

The mean differences between the control group and the other training groups were 0.55 for the SAQ group, 4.11 for the game-specific training group, and 7.07 for the combined training group. Each of these differences exceeded the confidence interval threshold of 1.06, suggesting that all training approaches resulted in significant enhancements compared to the control condition. Furthermore, the gap between the SAQ group and the game-specific training group was 3.56, and between the SAQ group and the combined training group was 6.52; both values were above the confidence interval, indicating statistically significant differences. The comparison between the game-specific training group and the combined training group yielded a difference of 2.96, which also surpassed the confidence interval, confirming a significant difference. Overall, the findings demonstrate that all three training methods effectively boosted speed, with the combined training showing the greatest improvement relative to the other groups.

# DISCUSSION OF FINDINGS

The combination of skill-based training with speed, agility, and quickness (SAQ) exercises has become increasingly prominent in basketball conditioning and skill development programs. This integrated approach is grounded in the understanding that success in basketball depends on both technical mastery and physical readiness, enabling players to perform skills effectively in game situations. Evidence suggests that incorporating SAQ training boosts overall athletic ability, which in turn enhances skill performance. For example, research by Sander et al. (2017) found that players who participated in combined agility and skill-focused drills experienced notable improvements in dribbling and shooting accuracy, likely due to enhanced neuromuscular coordination and quicker reaction times. Similarly, Spiteri et al. (2014) reported that agility training improved change-of-direction speed, a crucial factor for executing skills like evasive dribbling and maintaining defensive positioning. The addition of SAQ exercises fosters neuromuscular adaptations that lead to faster reactions and more efficient movement patterns—both essential during fast-paced game moments that demand quick decision-making and precise execution. As Little and Williams (2019) noted, integrated training methods can improve proprioception and motor control, resulting in more accurate skill execution under pressure. The synergy between technical drills and physical conditioning appears to create a transfer effect, where physical improvements support and enhance technical performance. For instance, Johnson et al. (2018) observed that players who underwent combined training routines demonstrated better layup techniques and defensive actions during actual matches, indicating that enhanced physical conditioning can positively impact technical skill proficiency.

# CONCLUSION

**Based on the results of the study,**

1. It was concluded that dribbling and shooting showed significant improvement for the basketball players due to SAQ training, game specific fitness training and combined training compared to control group.
2. It was concluded that there was a significant difference between the training groups. Among the three groups skill-based training group showed better improvement than the other training groups.

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